

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for annealing a semiconductor substrate, the method comprising:

providing a single wafer processing furnace;

turning on at least one heat source coupled to a chamber of the single wafer processing furnace;

heating a semiconductor substrate in [[a]] the chamber;

turning off the at least one heat source;

cooling the semiconductor substrate in the chamber;

wherein

the heating a semiconductor substrate includes raising a temperature of the semiconductor substrate from a first temperature value to a second temperature value;

the cooling the semiconductor substrate includes lowering the temperature of the semiconductor substrate from the second temperature value to a third temperature value;

the heating a semiconductor substrate includes absorbing an energy from the at least one heat source by the semiconductor substrate;

the cooling the semiconductor substrate includes flowing a first gas in a vicinity of at least one wall of the chamber, flowing a second gas in a vicinity of the at least one heat source, and flowing a third gas in a vicinity of the semiconductor substrate;

a first temperature of the first gas is lower than the second temperature value;

a second temperature of the second gas is lower than the second temperature value;

a third temperature of the third gas is lower than the second temperature value;

wherein the first temperature of the first gas, the second temperature of the second gas, and the third temperature of the third gas are provided at below room temperature.

2. (Original) The method of claim 1 wherein the first temperature, the second temperature, and the third temperature each is lower than the third temperature value.

3. (Original) The method of claim 2 wherein the first temperature, the second temperature, and the third temperature each equals -10°C.

4. (Original) The method of claim 1 wherein the first gas, the second gas, and the third gas each comprise at least one selected from a group consisting of nitrogen and helium.

5. (Original) The method of claim 1, the method further comprising maintaining the temperature of the semiconductor substrate at the second temperature value.

6. (Original) The method of claim 1 wherein the semiconductor substrate comprises a source region and a drain region, the source region including a source LDD region, the drain region including a drain LDD region.

7. (Currently Amended) A method for annealing a semiconductor substrate, the method comprising:

providing a single wafer processing furnace;
heating a semiconductor substrate in a chamber of the single wafer processing
furnace;

cooling the semiconductor substrate in the chamber;

wherein

the heating a semiconductor substrate includes raising a temperature of the semiconductor substrate from a first temperature value to a second temperature value;

the cooling the semiconductor substrate includes lowering the temperature of the semiconductor substrate from the second temperature value to a third temperature value;

the heating a semiconductor substrate includes absorbing an energy from at least one heat source by the semiconductor substrate;

the cooling the semiconductor substrate includes flowing a first gas in a vicinity of at least one wall of the chamber, flowing a second gas in a vicinity of the at least one heat source, and flowing a third gas in a vicinity of the semiconductor substrate;

a first temperature of the first gas is lower than the third temperature value;

a second temperature of the second gas is lower than the third temperature value;

a third temperature of the third gas is lower than the third temperature value;

wherein the first temperature of the first gas, the second temperature of the second gas, and the third temperature of the third gas are provided at below room temperature.

8. (Original) The method of claim 7 wherein the first temperature, the second temperature, and the third temperature each equals -10°c.

9. (Original) The method of claim 7 wherein the first gas, the second gas, and the third gas each comprise at least one selected from a group consisting of nitrogen and helium.

10. (Original) The method of claim 7, the method further comprising maintaining the temperature of the semiconductor substrate at the second temperature value.

11. (Original) The method of claim 7 wherein the semiconductor substrate comprises a source region and a drain region, the source region including a source LDD region, the drain region including a drain LDD region.

12. (Currently Amended) A method for annealing a semiconductor substrate, the method comprising:

providing a single wafer processing furnace;

heating a semiconductor substrate in a chamber of the single wafer processing furnace;

cooling the semiconductor substrate in the chamber;

wherein

the heating a semiconductor substrate includes raising a temperature of the semiconductor substrate from a first temperature value to a second temperature value;

the cooling the semiconductor substrate includes lowering the temperature of the semiconductor substrate from the second temperature value to a third temperature value;

the heating a semiconductor substrate includes absorbing an energy from at least one lamp by the semiconductor substrate;

the cooling the semiconductor substrate includes flowing a first gas in a vicinity of the at least one lamp, and flowing a second gas in a vicinity of the semiconductor substrate;

a first temperature of the first gas is lower than the third temperature value;

a second temperature of the second gas is lower than the third temperature value;

wherein the first temperature of the first gas, and the second temperature of the second gas, are provided at below room temperature.

13. (Original) The method of claim 12 wherein the first temperature and the second temperature each equals -10°c.

14. (Original) The method of claim 12 wherein the first gas, the second gas, and the third gas each comprise at least one selected from a group consisting of nitrogen and helium.

15. (Currently Amended) A method for annealing a semiconductor substrate, the method comprising:

providing a single wafer processing furnace;

turning on at least one heat source coupled to a chamber of the single wafer processing furnace;

heating a semiconductor substrate in [[a]] the chamber, the semiconductor substrate including a source region and a drain region, the source region including a source LDD region, the drain region including a drain LDD region;

turning off the at least one heat source;

cooling the semiconductor substrate in the chamber;

wherein

the heating a semiconductor substrate includes raising a temperature of the semiconductor substrate from a first temperature value to a second temperature value;

the cooling the semiconductor substrate includes lowering the temperature of the semiconductor substrate from the second temperature value to a third temperature value;

the heating a semiconductor substrate includes absorbing an energy from the at least one heat source by the semiconductor substrate;

the cooling the semiconductor substrate includes flowing a first gas in a vicinity of at least one wall of the chamber, flowing a second gas in a vicinity of the at least one heat source, and flowing a third gas in a vicinity of the semiconductor substrate;

a first temperature of the first gas is lower than the second temperature value;

a second temperature of the second gas is lower than the second temperature value;

a third temperature of the third gas is lower than the second temperature value;

wherein the first temperature of the first gas, the second temperature of the second gas, and the third temperature of the third gas are provided at below room temperature.

16. (Original) The method of claim 15 wherein the first temperature, the second temperature, and the third temperature each is lower than the third temperature value.

17. (Original) The method of claim 16 wherein the first temperature, the second temperature, and the third temperature each equals -10°c.

18. (Original) The method of claim 15 wherein the first gas, the second gas, and the third gas each comprise at least one selected from a group consisting of nitrogen and helium.

19. (Original) The method of claim 15, the method further comprising maintaining the temperature of the semiconductor substrate at the second temperature value.

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20. (Original) The method of claim 15 wherein the first temperature value equals the third temperature value.